

2



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/933,596	08/20/2001	Henry Johnson	H0001719 (4960)	6853

7590 04/25/2002

Honeywell International Inc.
101 Columbia Road
PO Box 2245
Morristown, NJ 07962

EXAMINER

DINH, TUAN T

ART UNIT PAPER NUMBER

2827

DATE MAILED: 04/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/933,596

Applicant(s)

JOHNSON ET AL.

Examiner

Tuan T Dinh

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Applicant's election without traverse of Group I (claims 1-10) in Paper No. 4 is acknowledged.

Drawings

2. The drawings are objected to because "**cross-hatching** does not shown in each figure". A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 1 is objected to because of the following informalities:
Claim 1, line 3, change "first and second surface" to --first and second surfaces--.
Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5, and 7-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Boyko et al. (U. S. Patent 5,450,290).

As to claim 1, Boyka discloses an electronic device as shown in figures 1-12 comprising:

a dielectric substrate (10, column 4, line 8 having first surface and second surfaces (14, 16-figure 5, column 4, line 18), and a via (12, column 4, line 17) connecting the first and second surfaces, wherein the via has a horizontal cross sectional area (see figures 5-9);

a first and a second sacrificial copper structure (18, column 4, lines 30-32) coupled to the first and second surfaces (14, 16) and surrounding the via (12), respectively, wherein each of the first and second sacrificial copper structures covers an area of no more than three times the horizontal cross sectional area of the via (see figures 5-8); and

wherein the first and second sacrificial copper structures (18) are formed on the substrate via a photolithographic process (column 4, lines 40-42).

As to claim 2, Boyka discloses an electronic device as shown in figures 1-12 wherein the substrate comprises a wiring board (column 4, line 13).

As to claim 3, Boyka discloses an electronic device as shown in figures 1-12 wherein the first and second surfaces (14, 16) of the dielectric material comprise a copper layer (40, 42, column 6, line 17).

As to claim 4, Boyka discloses an electronic device as shown in figures 1-12 wherein the via (12) has a via surface, and wherein the via surface comprises copper (column 4, lines 30-31).

As to claim 5, Boyka discloses an electronic device as shown in figures 1-12 wherein the copper of the via surface and the first and second sacrificial copper structure are formed in a single process (column 4, line 41).

As to claims 7 and 8, Boyka discloses an electronic device as shown in figures 1-12 further comprising a via fill material which is a resin disposed within the via (19, column 4, lines 34, 46).

As to claim 9, Boyka discloses an electronic device as shown in figures 1-12 wherein the via fill material is further disposed on the substrate in an area other than the via, and further comprising a photoresist layer (20, column 4, line 46) between the first surface and the via fill material.

As to claim 10, Boyka discloses an electronic device as shown in figures 1-12 wherein each of the first and second sacrificial copper structures (18) covers an area of no more than two times the horizontal cross sectional area of the via.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boyka et al. (U. S. Patent 5,450,290).

As to claim 6, Boyka discloses an electronic device as shown in figures 1-12 wherein the via has a via diameter (see figure 3), wherein the first and second sacrificial copper structures (18) have a first and second structure diameter, respectively, and wherein at least one of the first and second structure diameters are larger than the via diameter.

Boyka does not teach at least one of the first and second structure diameters are 150 microns.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have at least one of the first and second structure diameters are 150 microns as taught by Boyka for purpose of more conductor pads on a substrate in order to directly contact to an IC chip and also eliminate the need for any surface wiring.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hayakawa et al., Nomura et al., Farquhar et al., Bhatt et al., Kubo et al., and Parker, Jr. et al. disclose related art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T Dinh whose telephone number is 703-306-5856. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on 703-305-9883. The fax phone numbers

Application/Control Number: 09/933,596

Page 6

Art Unit: 2827

for the organization where this application or proceeding is assigned are 703-305-1341 for regular communications and 703-305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

TD

April 20, 2002


KAMAND CUNEO
PRIMARY EXAMINER